NOAA SATELLITES

Tracking weather, climate change from space

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION • UNITED STATES DEPARTMENT OF COMMERCE

Operating the nation's fleet of high-powered environmental satellites, tracking climate change and potentially deadly severe weather, is one of NOAA's major duties. NOAA manages a total of eight satellites and – each day – oversees the processing and distribution of more than 16 billion bytes of environmental data from these spacecraft.

The key user of satellite data is NOAA's National Weather Service, which uses the information to develop life-saving forecasts and warnings of hurricanes, tornadoes, floods, and long-term seasonal outlooks.

NOAA Satellite Fleet

NOAA currently has four geostationary operational environmental satellites, or GOES: two are in operation, one is stored in orbit as a ready backup and the other is being used to provide better coverage of South America. GOES, which operate from a fixed position 22,300 miles above the east and west coasts, take constant images and measurements of the air, land and waters of the Western Hemisphere. GOES are the nation's primary hurricane trackers from space.

NOAA is part of the Initial Joint Polar-orbiting Satellite System, a joint venture with Europe, in which two polar-orbiting environmental satellites are operated. NOAA-18, a NOAA polar-orbiting environmental satellite, or POES, circles the globe in an afternoon orbit, while MetOp-A, the European satellite, flies in the morning orbit. NOAA also manages the operations of the Department of Defense's Meteorological Satellite Program.

POES, which operate 540 miles over the Earth, are valuable in monitoring changes in the atmosphere and ocean temperatures and for detecting the onset of climate phenomena, such as El Nino and La Nina. The data they collect from space feed NOAA's long-range forecast models and help scientists keep tabs on the global climate change.

A typical POES spacecraft has an average lifespan of 3.5 years, but can sometimes last considerably longer. Each spacecraft is about 13.75 feet long and 6.2 feet in diameter and weighs 3,130 pounds at liftoff. A typical GOES is built to last five years, but recent satellites have lasted up to 13 years. Current GOES are of 27.4 feet by 29.8 feet and weigh 7,076 pounds when launched.

NOAA satellite image of Hurricane Katrina.

"Plan B" Firmly In Place

NOAA's key requirements are to provide continuity of operations from space for users here in the United States. NOAA has an elaborate system firmly in place, including a complex system of back-up satellites and partnerships with international governments that would enable other countries to supply satellite continuity if NOAA's own reinforcements ever fail.

(continued on next page)

(continued from previous page)

NOAA Satellites On Display

During the 2005 Atlantic hurricane season, when a record 28 named storms developed, NOAA satellites sent a total of 11,736 images of these cyclones to forecasters at NOAA's National Hurricane Center in Miami. In the comparatively quiet 2006 hurricane season, the number of images was 7,380. And during the life of Hurricane Dean, a powerful Category 5 storm in late August 2007, GOES captured 285 images of the storm each day.

For Hurricane Katrina in August 2005, GOES sent 716 images of the storm between August 26 and August 30 of what became the costliest hurricane in U.S. history. NOAA's National Weather Service meteorologists in Slidell, Louisiana, credited the GOES imagery as a valuable tool in developing their forecasts.

Future NOAA Satellites

NOAA and its key partner NASA are planning the next generation of satellites that will strengthen the prediction and tracking of weather and climate change. Known as the GOES-R series, these next generation satellites are expected to bring key improvements in data for predicting severe space and Earth weather, including hurricanes. GOES-R, which is scheduled to launch in late 2014, will bring data resulting in longer watch and warning lead times and a better definition of the threat area for hurricanes and other dangerous weather.

Also planned for the future is the National Polar-orbiting Operational Environmental Satellite System, or NPOESS. This tri-agency cooperative satellite system run by U. S. Air Force, NOAA and NASA will combine NOAA's current polar satellite operations with the Department of Defense's Meteorological Satellite Program into one system. With the launch of the first spacecraft planned for 2013, NPOESS will provide improved data and imagery for better weather forecasts, severe-weather monitoring and detection of climate change.